

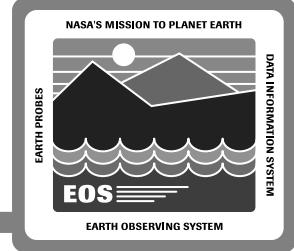
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# Dynamic Pages

## Shawn Firth

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17 October 1995



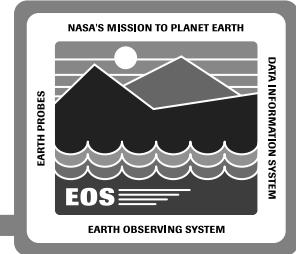
# Dynamic Pages

Motif window used to display telemetry parameters

## Design Features

- Telemetry parameters are displayed on Dynamic Pages
- Dynamic Pages can display
  - Spacecraft telemetry (real-time, simulation or replay)
  - Ground telemetry (acquisition failure notification, return channel time delay measurement, time transfer)
  - Off-line analysis data (data sets)
- Gets parameter values via a data source
- Can have more than one data source
  - Can display multiple parameters from multiple data sources on the same page
    - Real time and replay data on the same page
    - Real time and simulation data on the same page
    - Real time AM-1 and PM-1 data on the same page

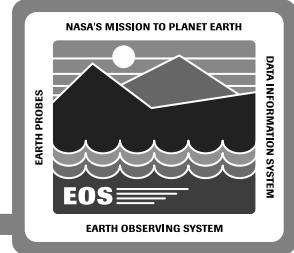
# Dynamic Page



## Design Features (cont.)

- Built using industry standard libraries and COTS
- Composed of display items, labels and separators
- Display Items
  - Alphanumeric
  - Graph
  - Table
  - Schematic
- Can be defined by the user via display builder
- Can snap itself
  - Generates Encapsulated PostScript (EPS) file

# Data Source



**Associated with one logical string**

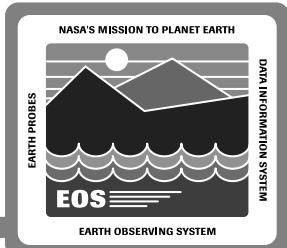
**Provides connection between the display items and the current parameter values from the logical string**

**Is automatically established at start up by the dynamic page**

**Can be changed “on-the-fly” by the user**

- **Connect to another logical string**
  - Real-Time
  - Replay
  - Simulation

# Data Source Selector



**Data Source Selector**

**Rooms:**

- MICAL
- MICAMERA
- MIANALYSIS
- MICOMMAND

▲  
|  
▼

**Additional Rooms**

**Page**

	<b>Assigned Data Source/ Type</b>
MICAL-MIPOWER (A)	String1 - M
MICAL-MIPOWER (B)	String5 - M
MICAL-MIBATGRPH	String2 - T
MICAL-MIPWRGRPH	String2 - T
MICAMERA-MIBATTEMP	String3 - M
MIANALYSIS-MIPOWER	String5 - M
MIANALYSIS-MIPWRSCH	??????
MIANALYSIS-MIPWRGRPH	String2 - T

**Connection Type**

- ◆ **Default**
- ◊ **Mirrored**
- ◊ **Tailored**

**Established Data Sources**

*String1 AM1 DB013 R/T OPER
*String2 AM1 DB010 D-RP OPER
*String3 AM1 DB013 R/T TRNG
String4 AM1 DB007 S-RP OPER
*String5 AM1 DB007 S-RP OPER

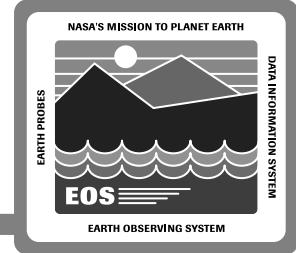
◀  ▶

**Parameter Assignments**

**Global Switch**

**OK**    **Apply**    **Reset**    **Cancel**    **Help**

# Display Items



## Display Item Types

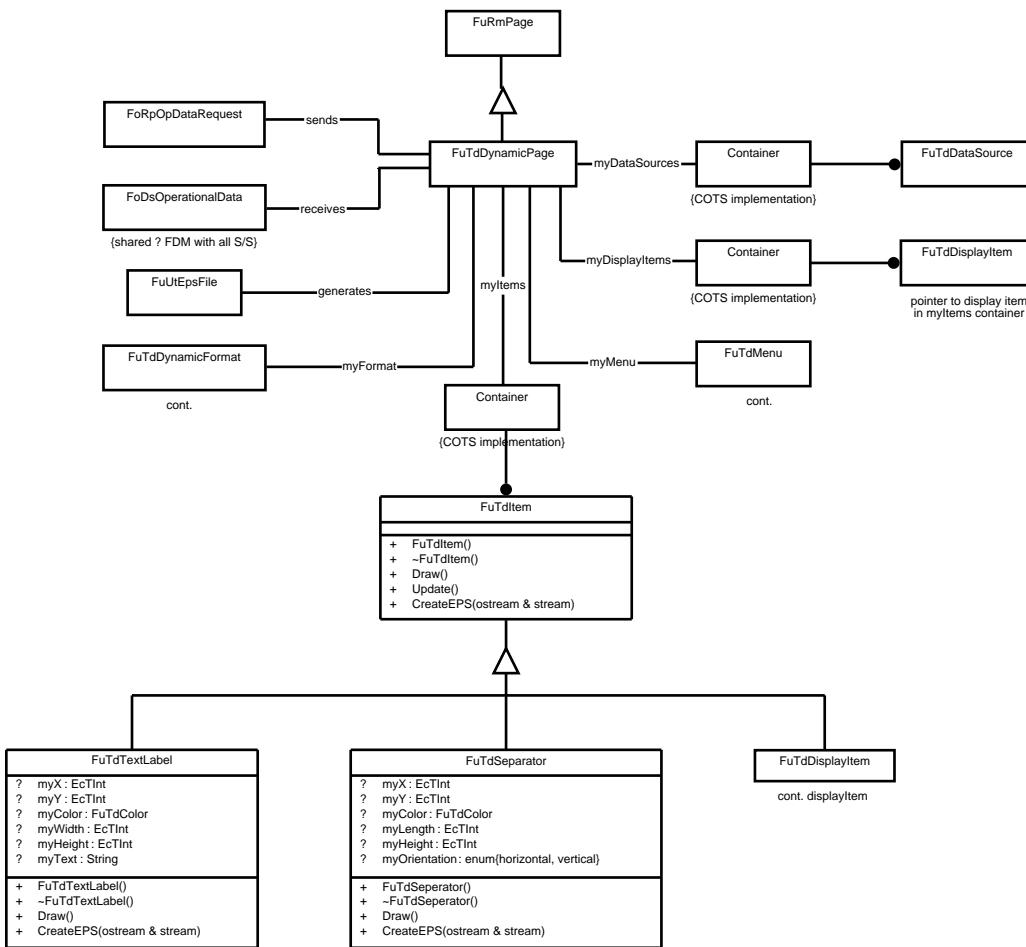
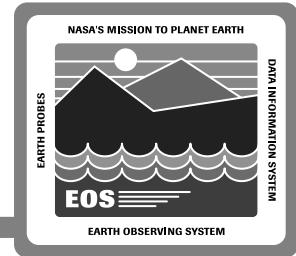
- Field
  - Value, Label, Units, Flags
- Graph
  - Parameters vs. Time, Parameters vs. Parameter, 2D or 3D
- Table
  - Spreadsheet like, parameter values by time
- Schematic
  - Point, Line, Polygon, Circle, Ellipse, Square, Rectangle and Icon

Know how to update themselves

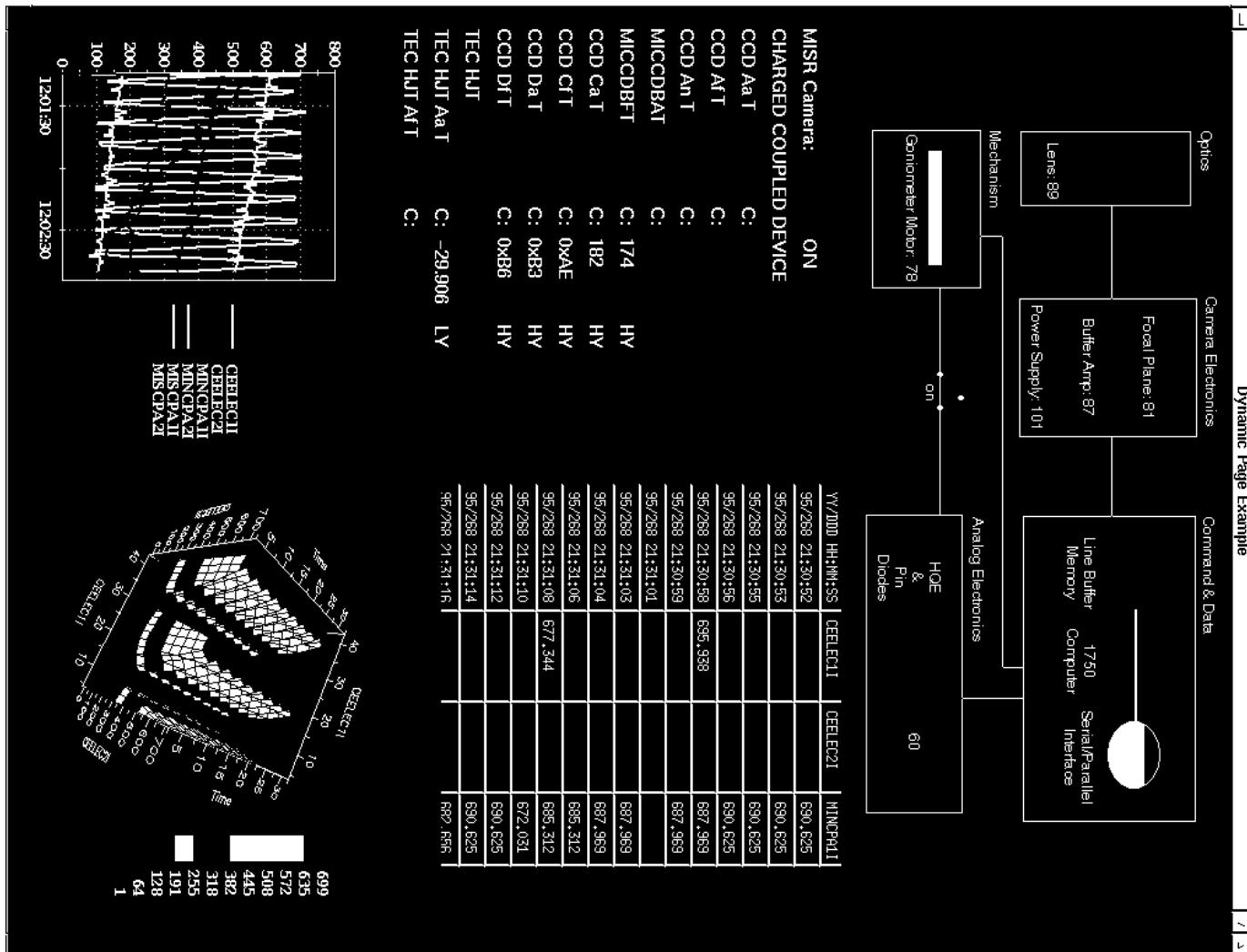
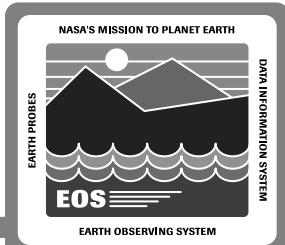
Know how to generate EPS

Associated with one or more parameters from one or more data sources

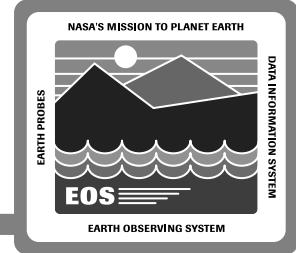
# Dynamic Pages Cont.



# Dynamic Page Example



# Field



**Used to display alphanumeric values**

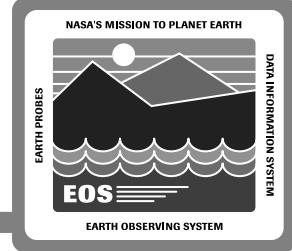
**Built using X11 graphics components**

**Contains one telemetry parameter from one data source**

**Is composed of**

- Value
- Label (optional)
- Units (optional)
- Flags (optional)

**The user can rearrange the parts of the field to best fit the needs of the data to be displayed**



# Field Cont.

## Value

- Can be displayed as
  - Raw - The raw bits from the telemetry stream
  - Decoded - The integer passed into conversion routines
  - Converted - The converted value
- Can be displayed in
  - Formatted 124
  - Binary 1111100
  - Octal 174
  - Hex 7C

## Label (optional)

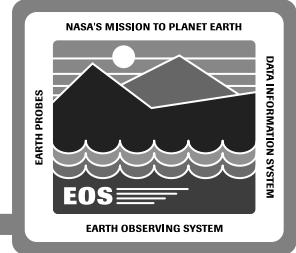
- Mnemonic/Descriptor

## Units (optional)

## Flags (optional)

- Limits, Delta, Quality/Static

# Graph



**COTS graph solution - XRT/graph and XRT/3d**

**Graph types**

- Line
- Scatter
- Surface

**Used to display real-time or static data (off-line analysis products)**

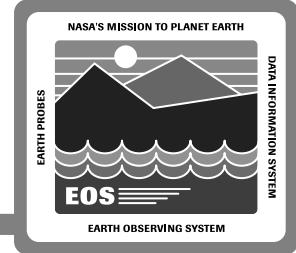
**Up to 6 parameters per graph from up to 6 different data sources**

**Can have 2 different Y axes on the same graph**

**Data that can be graphed**

- Parameter(s) over time or parameter vs. parameter (2D)
- Parameter vs. parameter vs. time or parameter vs. parameter vs. parameter (3D)
- Real-time parameters and/or historical data from different times

# Table



**COTS table solution - XRT/table**

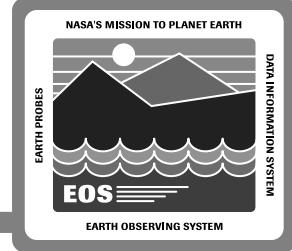
**Spreadsheet like display**

**Displays parameters over time**

**Used to display real-time or static data (off-line analysis products)**

**Can contain up to 50 parameters from more than one data source**

# Schematic



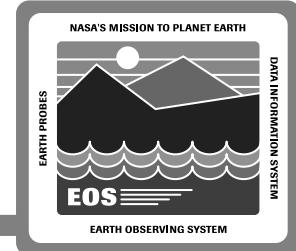
Used to display 2D representations of spacecraft subsystems or data/procedure flows

Built using X11 graphics components

Schematic parts

- Can be associated with one parameter from one data source
- Static or changes color when associated w/analog parameter
  - Point
  - Line
- Static or multiple states when associated w/discrete parameter
  - Icon
- Static, empty, filled, or filling when associated w/analog parameter
  - Square
  - Rectangle
  - Circle
  - Ellipse

# Display Builder



**Allows the user to build/modify dynamic pages**

**Drag and drop construction**

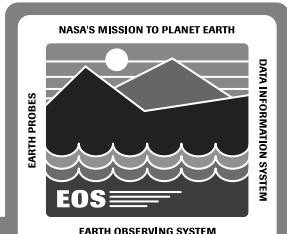
**WYSIWYG**

**The user can specify the format/characteristics for each of the widgets**

- Position
- Default data source(s)
- Size (schematics, graphs, table)
- Colors (schematics, graphs, table)

**Saves page definition so that it can be modified later and/or shared with other team members (Data Mover)**

# Display Builder Cont.



**Display Builder**

**File Edit Utility Help**

**Display Item**

- Field
- Separator
- Separator
- Label

- Graph
- Table

**Schematic Display Item**

- Rectangle
- Square
- Ellipse
- Circle

- Polygon
- Line
- Arc
- Point

- Icons

**Action**

- Format
- Delete
- Data Source

**Build to CM Build to Local Cancel**

**Dynamic Page Example**

Output Camera Electronics Command & Data

Power Plane: Power Amplifier Line Buffer Memory 750 Output Serial Parallel Interface

Logic Verbs

Generator Filter off

MISR Camera: ####LLDQ  
CHARGED COUPLED DEVICE  
CCD AuT UUU#####LLDQ  
CCD AlT UUU#####LLDQ  
CCD AnT UUU#####LLDQ  
MICCDBAT UUU#####LLDQ

Table #1